Bulletin No. 40, Fig. 3, page 15. This setting comes the nearest to being in agreement with the flow conditions existing in a boiler set as recommended by the builder. Mr. Bement, however, has altogether too great an area in his first and last pass.

Fig. 177 shows the gas flow in a two pass horizontally baffled boiler. This design of baffling is better than the single pass. The gas velocities computed by the Bureau of Mines are much higher (see curve, Fig. 178) than those of the single-pass boiler. In reality the gain in this boiler is due to the longer path of the gases in contact with the tubes, but it is extremely doubtful whether the gas velocity is any higher than in the single-pass boiler. Fig. 179 shows curves of temperatures made by locating the thermo couples at different distances from the water legs. The drops in curves D and C indicate the same pockets of cooler gas which occurred in the single-pass setting. While the regularity of the curve *E* would seem to show that this couple had not at any time come in contact with the stream of hot gases.

The location of the last thermo couple in all of these tests seems to the writer to cause some doubt as to whether it really showed the temperature of the stream of hot gases leaving the boiler. This stream of ascending gas would have a fairly high velocity due entirely to its temperature and it is extremely unlikely that it filled the full area of the gas uptake, being surrounded by a layer of relatively cooler gases.